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| 10/737,121 | 12/17/2003 | Hiroshi Gotoh | 246602US2 | 6032 |

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| EXAMINER | |
|---|---|
| NGUYEN, JOSEPH H | |

| ART UNIT | PAPER NUMBER |
|---|---|
| 2815 | |

DATE MAILED: 07/27/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/737,121 | GOTOH ET AL. | |
| | Examiner | Art Unit | |
| | Joseph Nguyen | 2815 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☐ Responsive to communication(s) filed on *26 April 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1,3,4,8-22 and 26-63* is/are pending in the application.

4a) Of the above claim(s) *17-22* is/are withdrawn from consideration.

5)☒ Claim(s) *50-54* is/are allowed.

6)☒ Claim(s) *1,3,4,8-16,26-49 and 55-63* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on *17 December 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ ~~Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)~~ Paper No(s)/Mail Date *6/29/05*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

## DETAILED ACTION

### *Claim Objections*

Claim 3 is objected to because of the following informalities: delete "of" in line 2 and insert "or" in line 2. Appropriate correction is required.

Applicant is advised that should claims 13-14, 34-35 and 46-47 be found allowable, claims 34 and 35 will be objected to under 37 CFR 1.75 as being a substantial duplicate thereof. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

### *Claim Rejections - 35 USC § 112*

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1, 3-4, 8-16 and 26-37 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

A broad range or limitation together with a narrow range or limitation that falls within the broad range or limitation (in the same claim) is considered indefinite, since the resulting claim does not clearly set forth the metes and bounds of the patent protection desired. See MPEP § 2173.05(c). Note the explanation given by the Board

of Patent Appeals and Interferences in *Ex parte Wu*, 10 USPQ2d 2031, 2033 (Bd. Pat. App. & Inter. 1989), as to where broad language is followed by "such as" and then narrow language. The Board stated that this can render a claim indefinite by raising a question or doubt as to whether the feature introduced by such language is (a) merely exemplary of the remainder of the claim, and therefore not required, or (b) a required feature of the claims. Note also, for example, the decisions of *Ex parte Steigewald*, 131 USPQ 74 (Bd. App. 1961); *Ex parte Hall*, 83 USPQ 38 (Bd. App. 1948); and *Ex parte Hasche*, 86 USPQ 481 (Bd. App. 1949). In the present instance, claims 1 and 26 recites the broad recitation "the element selected from the group consisting of Au, Ag, Zn, Cu, Ni, Sr, Sm, Ge and Bi" and "at least one element selected from the group consisting of Nd, Y, Fe, and Co", and the claims also recites "the element selected from the group consisting of Ag, Zn, Cu and Ni" and "at least one element selected from the group consisting of Nd and Y (claim 1), Fe and Co (claim 26)" which is the narrower statement of the range/limitation.

Further, it is not understood what "further contains", as its alloy component, at least one element... It will be better defined if it is corrected to read "said aluminum alloy further contains..."

Claims 3-4, 8-16 and 27-37 are also rejected due to their dependency upon the rejected base claims 1 and 26 above.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1, 3-4, 9, 11-16, 26-28, 30, 33-42, 45-49, 55-59 and 60-63 are rejected under 35 U.S.C. 103(a) as being unpatentable over Inoue et al in view of Yamamoto et al.

Regarding claims 1 and 26, as best understood, Inoue et al. discloses on figure 2 an electronic device comprising a first electrode 13 including a metal oxide (col. 7, lines 7-13); and a second electrode 8 including an aluminum alloy film (col. 5, lines 49-56), said second electrode being directly contacted and electrically connected to said first electrode. Inoue et al. does not disclose at least a part of alloy components constituting said aluminum alloy film as a precipitate and containing at least one element in the range of 0.1 to 6 at % as its alloy component, the element selected from the group consisting of Ni. However, Yamamoto et al. discloses at least a part of alloy components constituting said aluminum alloy film as a precipitate (col. 4, line 38) and containing at least one element in the range of 0.1 to 6 at % as its alloy component, the element selected from the group consisting of Ni (col. 2, lines 38-39). In view of such teaching, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Inoue et al. by having at least a part of alloy components constituting said aluminum alloy film as a precipitate and containing at least one

element in the range of 0.1 to 6 at % as its alloy component, the element selected from the group consisting of Ni to reduce hillocks (col. 2, lines 26-27, Yamamoto et al.).

Regarding claims 3 and 27, Inoue et al. discloses the metal oxide 13 is indium tin oxide (col. 7, lines 7-13).

Regarding claims 4 and 28, Yamamoto et al. discloses the aluminum alloy film contains at least Ni as its alloy component (col. 2, lines 38-39).

Regarding claims 9 and 30, it is inherent that a particle of the precipitate as disclosed by Yamamoto et al. has a size of more than 0.01μm in major diameter and the number of the particle exceeds 0.13 particle/ 100 $\mu m^2$ since it comprises the same material as claimed.

Regarding claims 10 and 31, it would have been obvious to one having ordinary skill in the art at the time of the invention was made to modify Inoue et al. and Yamamoto et al. by having the area factor of the precipitate exceeding 0.5%, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Regarding claims 12 and 33, it is inherent that a particle of the precipitate as disclosed by Yamamoto et al. has a size of more than 0.05μm in major diameter and the number of the particle exceeds 21 particle/ 100 $\mu m^2$ since it comprises the same material as claimed. .

Regarding claims 13-14 and 34-35, Yamamoto et al. discloses the aluminum alloy contains Nd (col. 8, line 50), and it is inherent a particle of the precipitate has a size of

more than 0.02μm in major diameter and the number of the particle exceeds 33 particle/ 100 $\mu m^2$.

Regarding claims 15 and 36, Inoue et al. discloses on figure 2 the electronic device comprises a thin film transistor (col. 6, line 26) arranged on a glass substrate 1 (col. 6, line 40) and the thin film transistor is electrically connected to said first electrode through the aluminum alloy film.

Regarding claims 16 and 37, Inoue et al. discloses the first electrode 13 is a pixel electrode (col. 7, line 13) and the electronic device is a display device (col. 15, line 66).

Regarding claim 38, it is inherent that a particle of the precipitate as disclosed by Yamamoto et al. has a size of more than 0.01μm in major diameter and the number of the particle exceeds 0.13 particle/ 100 $\mu m^2$ (also see rejection of claim 1 above) since it comprises the same material as claimed. .

Regarding claim 39, Yamamoto et al. discloses the aluminum alloy film contains Ni in the range of 0.1 to 6 at % as its alloy component (col. 2, line 39).

Regarding claim 40, Yamamoto et al. discloses the aluminum alloy film contains Nd (col. 8, line 50) as another alloy component in the range of 0.1 to 6 at % (col. 2, line 44).

Regarding claim 41, Inoue et al. discloses the metal oxide is indium tin oxide (col. 7, lines 7-13).

Regarding claim 42, Yamamoto et al. discloses the aluminum alloy film contains at least Ni as its alloy component (col. 2, line 39).

Regarding claim 44, it would have been obvious to one having ordinary skill in the art at the time of the invention was made to modify Inoue et al. and Yamamoto et al. by having the area factor of the precipitate exceeding 0.5%, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Regarding claim 45, it is inherent that a particle of the precipitate as disclosed by Yamamoto et al. has a size of more than 0.05μm in major diameter and the number of the particle exceeds 21 particle/ 100 $\mu m^2$ since it comprises the same material as claimed. .

Regarding claims 46-47, Yamamoto et al. discloses the aluminum alloy contains Nd (col. 8, line 50), and it is inherent a particle of the precipitate has a size of more than 0.02μm in major diameter and the number of the particle exceeds 33 particle/ 100 $\mu m^2$.

Regarding claim 48, Inoue et al. discloses on figure 2 the electronic device comprises a thin film transistor (col. 6, line 26) arranged on a glass substrate 1 (col. 6, line 40) and the thin film transistor is electrically connected to said first electrode through the aluminum alloy film.

Regarding claim 49, Inoue et al. discloses the first electrode 13 is a pixel electrode (col. 7, line 13) and the electronic device is a display device (col. 15, line 66).

Regarding claim 55, it is inherent that a particle of the precipitate as disclosed by Yamamoto et al. has a size of more than 0.05μm in major diameter and the number of the particle exceeds 21 particle/ 100 $\mu m^2$ (also see rejection of claim 1 above) since it comprises the same material as claimed. .

Regarding claim 56, Yamamoto et al. discloses the aluminum alloy film contains as another alloy component Nd (col. 8, line 50) in the range of 0.1 to 6 at % (col. 2, line 44).

Regarding claim 57, Inoue et al. discloses the metal oxide 13 is indium tin oxide (col. 7, lines 7-13).

Regarding claim 58, Inoue et al. discloses on figure 2 the electronic device comprises a thin film transistor (col. 6, line 26) arranged on a glass substrate 1 (col. 6, line 40) and the thin film transistor is electrically connected to said first electrode through the aluminum alloy film.

Regarding claim 59, Inoue et al. discloses the first electrode 13 is a pixel electrode (col. 7, line 13) and the electronic device is a display device (col. 15, line 66).

Regarding claim 60, it is inherent that a particle of the precipitate as disclosed by Yamamoto et al. has a size of more than 0.02μm in major diameter and the number of the particle exceeds 33 particle/ 100 $\mu m^2$ (also see rejection of claim 1 above) since it comprises the same material as claimed.

Regarding claim 61, Inoue et al. discloses the metal oxide 13 is indium tin oxide (col. 7, lines 7-13).

Regarding claim 62, Inoue et al. discloses on figure 2 the electronic device comprises a thin film transistor (col. 6, line 26) arranged on a glass substrate 1 (col. 6, line 40) and the thin film transistor is electrically connected to said first electrode through the aluminum alloy film.

Regarding claim 63, Inoue et al. discloses the first electrode 13 is a pixel electrode (col. 7, line 13) and the electronic device is a display device (col. 15, line 66).

Claims 8, 29 and 43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Inoue et al and Yamamoto et al and further in view of Takayama (US 5,903,055).

Regarding claims 8, 29 and 43, Inoue et al. and Yamamoto et al disclose substantially all the structure set forth in the claimed invention except the electrical resistivity of said aluminum alloy film being not larger than 8-μΩ cm. However, Takayama teaches that the electrical resistivity of said aluminum alloy film being not larger than 8-μΩ cm (col. 7, lines 32-35). In view of such teaching, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Inoue et al. and Yamamoto et al by having the electrical resistivity of said aluminum alloy film being not larger than 8μΩ cm for the purpose of eliminating hillocks and pinholes in the conductive line material (col. 7, lines 32-35, Takayama).

***Allowable Subject Matter***

Claims 50-54 are allowed.

The following is an examiner's statement of reasons for allowance:

The reference (s) of record do not teach or suggest, either singularly or in combination at least the limitation of "wherein said aluminum alloy film containing Ni has a Ni-concentrated layer whose Ni content in a thickness region of 1 to 10nm from the

surface of said aluminum alloy film is not more than the Ni content inside the aluminum alloy film plus 8 at%" for claim 50.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

### *Response to Arguments*

Applicant's arguments with respect to claims 1, 3-4, 8-16, 26-49 and 55-63 have been considered but are moot in view of the new ground(s) of rejection.

### *Conclusion*

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Joseph Nguyen whose telephone number is (571) 272-1734. The examiner can normally be reached on Monday-Friday, 7:30 am- 4:30 pm. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Thomas can be reached on (571) 272-1664. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300 for regular communications.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

JN
July 25, 2005

Tom Thomas

TOM THOMAS
SUPERVISORY PATENT EXAMINER